

CLAIM AMENDMENT(S)

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4 **1.** (original) One or more processor-accessible media comprising
5 processor-executable instructions that, when executed, direct a device to perform
6 actions comprising:

7 comparing an accuracy indicator to at least one threshold, the accuracy
8 indicator corresponding to a reference macroblock selected for a target
9 macroblock;

10 ascertaining a refinement case from a plurality of refinement cases based on
11 the comparing, each refinement case of the plurality of refinement cases defining a
12 plurality of test points in relation to the reference macroblock; and

13 analyzing the ascertained refinement case with regard to the target
14 macroblock.

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16 **2.** (original) The one or more processor-accessible media as recited in
17 claim 1, wherein the accuracy indicator comprises a sum of absolute differences
18 (SAD) value.

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20 **3.** (original) The one or more processor-accessible media as recited in
21 claim 1, wherein the action of comparing comprises an action of:

22 comparing the accuracy indicator to at least two thresholds.
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1 **4.** (original) The one or more processor-accessible media as recited in
2 claim 3, wherein the at least two thresholds comprise a first threshold that is set
3 between 3500 and 4500 and a second threshold that is set between 5500 and 6500.
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5 **5.** (original) The one or more processor-accessible media as recited in
6 claim 3, wherein the at least two thresholds comprise a first threshold and a second
7 threshold, with the second threshold greater than the first threshold; and wherein
8 the action of comparing further comprises an action of:

9 determining whether the accuracy indicator is less than the first
10 threshold, is greater than the first threshold but less than the second
11 threshold, or is greater than the second threshold.
12

13 **6.** (original) The one or more processor-accessible media as recited in
14 claim 1, wherein the action of ascertaining comprises an action of:

15 ascertaining the refinement case from the plurality of refinement
16 cases responsive to a range of values in which the accuracy indicator falls.
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18 **7.** (original) The one or more processor-accessible media as recited in
19 claim 1, wherein the plurality of refinement cases comprises a first refinement
20 case, a second refinement case, and a third refinement case.
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1 **8.** (original) The one or more processor-accessible media as recited in
2 claim 7, wherein the first refinement case comprises a first collection of test points
3 in a cross pattern that are one pixel from a central pixel, the second refinement
4 case comprises a second collection of test points in a cross pattern and in an “X”
5 pattern that are one pixel from a central pixel, and the third refinement case
6 comprises a third collection of test points in a cross pattern and in an “X” pattern
7 that are two pixels from a central pixel.

8
9 **9.** (original) The one or more processor-accessible media as recited in
10 claim 1, wherein the action of analyzing comprises actions of:

11 determining a respective accuracy indicator for each respective test
12 point of the ascertained refinement case to create a collection of accuracy
13 indicators; and

14 selecting the best accuracy indicator from the collection of accuracy
15 indicators, the selected best respective accuracy indicator associated with its
16 respective test point.

17
18 **10.** (original) The one or more processor-accessible media as recited in
19 claim 9, comprising the processor-executable instructions that, when executed,
20 direct the device to perform a further action comprising:

21 forwarding a motion vector that corresponds to the respective test point that
22 is associated with the selected best respective accuracy indicator.

1 **11.** (original) The one or more processor-accessible media as recited in
2 claim 9, wherein the collection of accuracy indicators includes an accuracy
3 indicator of the central pixel, wherein the accuracy indicator of the central pixel is
4 the accuracy indicator corresponding to the reference macroblock selected for the
5 target macroblock.

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7 **12.** (original) The one or more processor-accessible media as recited in
8 claim 1, comprising the processor-executable instructions that, when executed,
9 direct the device to perform a further action comprising:

10 determining a set of accuracy indicators for a set of motion vector candidate
11 predictors with regard to the target macroblock.

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13 **13.** (original) The one or more processor-accessible media as recited in
14 claim 12, comprising the processor-executable instructions that, when executed,
15 direct the device to perform a further action comprising:

16 selecting the best accuracy indicator from the set of accuracy indicators, the
17 selected best accuracy indicator comprising the accuracy indicator corresponding
18 to the reference macroblock selected for the target macroblock.

19
20 **14.** (original) The one or more processor-accessible media as recited in
21 claim 12, wherein the set of motion vector candidate predictors comprises three
22 motion vectors plus a null vector.

1 **15.** (original) The one or more processor-accessible media as recited in
2 claim 12, wherein the set of motion vector candidate predictors comprises at least
3 one motion vector that is temporally related to the target macroblock and spatially
4 identical and at least one motion vector that is spatially related to the target
5 macroblock and temporally identical.

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7 **16.** (original) The one or more processor-accessible media as recited in
8 claim 12, wherein the set of motion vector candidate predictors comprises: (i) a
9 first motion vector that is from a first macroblock that is adjacent to the target
10 macroblock and within a current frame thereof; (ii) a second motion vector that is
11 from a second macroblock that is adjacent to the target macroblock and within the
12 current frame, but orthogonally located with respect to the first motion vector, and
13 (iii) a third motion vector that is from a third macroblock that is aligned with the
14 target macroblock but located in a reference frame.

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16 **17.** (original) The one or more processor-accessible media as recited in
17 claim 1, wherein the processor-executable instructions comprise at least part of
18 video encoding software.

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20 **18.** (original) The one or more processor-accessible media as recited in
21 claim 1, wherein the one or more processor-accessible media comprise at least one
22 of (i) one or more storage media and (ii) one or more transmission media.

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25 **19. – 31.** (canceled)

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3 **32.** (original) A device comprising:

4 a candidate selector that is capable of accepting a current macroblock, the
5 candidate selector adapted to select a motion vector candidate from a set of motion
6 vector candidates with regard to the current macroblock using an accuracy
7 indicator corresponding to the selected motion vector candidate;

8 a refinement case ascertainment that is capable of accepting the selected
9 motion vector candidate and the accuracy indicator corresponding thereto, the
10 refinement case ascertainment adapted to ascertain a refinement case from among a
11 plurality of refinement cases based on a first threshold and a second threshold and
12 responsive to the accuracy indicator; and

13 a refinement case analyzer that is capable of accepting the ascertained
14 refinement case, the refinement case analyzer adapted to analyze a collection of
15 points defined by the ascertained refinement case with regard to the current
16 macroblock to potentially refine the selected motion vector candidate.

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18 **33.** (original) The device as recited in claim 32, wherein the candidate
19 selector is further capable of accepting a current frame that includes the current
20 macroblock.
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1 **34.** (original) The device as recited in claim 32, wherein the candidate
2 selector is further capable of accepting a reference frame, the candidate selector
3 configured to extract reference macroblock candidates from the reference frame in
4 accordance with the set of motion vector candidates.

5
6 **35.** (original) The device as recited in claim 34, wherein the candidate
7 selector is further configured to determine a respective accuracy indicator for each
8 of the reference macroblock candidates; the candidate selector further adapted to
9 select the selected motion vector candidate by selecting the motion vector
10 candidate corresponding to a best respective accuracy indicator.

11
12 **36.** (original) The device as recited in claim 32, wherein the set of
13 motion vector candidates consists of three motion vectors and a null vector.

14
15 **37.** (original) The device as recited in claim 32, wherein the set of
16 motion vector candidates comprises two motion vectors from two macroblocks
17 that are temporally identical and spatially contiguous to the current macroblock
18 and one motion vector from one macroblock that is spatially identical and
19 temporally contiguous to the current macroblock.

1 **38.** (original) The device as recited in claim 32, wherein the device
2 further comprises:

3 an accuracy indicator determiner that determines accuracy indicators for
4 reference macroblocks from a reference frame with regard to the current
5 macroblock of a current frame.

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7 **39.** (original) The device as recited in claim 38, wherein the accuracy
8 indicator determiner comprises a sum of absolute differences (SAD) determiner.

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10 **40.** (original) The device as recited in claim 32, wherein the plurality of
11 refinement cases comprises a first case, a second case, and a third case; and
12 wherein the refinement case ascertainment is configured to implement the following
13 selection criteria:

14 if the accuracy indicator is less than the first threshold, then
15 the first case is ascertained;

16 if the first threshold is less than the accuracy indicator which
17 is less than the second threshold, then the second case is ascertained;
18 and

19 if the accuracy indicator is greater than the second threshold,
20 then the third case is ascertained.

1 **41.** (original) The device as recited in claim 40, wherein the refinement
2 case analyzer is further adapted (i) to analyze the first case, when ascertained by
3 the refinement case ascertainment, by testing four contiguous points at the selected
4 motion vector candidate on a cross direction, (ii) to analyze the second case, when
5 ascertained by the refinement case ascertainment, by testing eight contiguous points
6 around the selected motion vector candidate, and (iii) to analyze the third case,
7 when ascertained by the refinement case ascertainment, by testing eight points that are
8 around and that are two pixels away from the selected motion vector candidate.

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10 **42.** (original) The device as recited in claim 32, wherein each
11 refinement case of the plurality of refinement cases defines a plurality of test
12 points.

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14 **43.** (original) The device as recited in claim 32, wherein the refinement
15 case ascertainment is configured to associate a respective refinement case of the
16 plurality of refinement cases to a respective range of accuracy values of a plurality
17 of ranges of accuracy values, the plurality of ranges of accuracy values at least
18 partially delineated by the first threshold and the second threshold; wherein the
19 refinement case ascertainment is further adapted to ascertain the ascertained
20 refinement case by ascertaining the respective range of accuracy values of the
21 plurality of ranges of accuracy values in which the accuracy indicator belongs.

1 **44.** (original) The device as recited in claim 32, wherein the refinement
2 case analyzer is further adapted to refine the selected motion vector candidate
3 when an accuracy indicator corresponding to a point of the collection of points is
4 better than the accuracy indicator corresponding to the selected motion vector
5 candidate.

6
7 **45.** (original) The device as recited in claim 32, wherein the collection
8 of points includes a plurality of test points and a central pixel that corresponds to
9 the selected motion vector candidate.

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11 **46.** (original) The device as recited in claim 32, wherein the refinement
12 case analyzer is configured to select a best accuracy indicator from a collection of
13 respective accuracy indicators created for respective points of the collection of
14 points.

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16 **47.** (original) The device as recited in claim 32, wherein the device
17 further comprises:

18 a discrete cosine transform (DCT) component that performs integer DCT
19 calculations on residual error values in a video encoding operation.

1 **48.** (original) The device as recited in claim 32, wherein the device
2 further comprises:

3 an inverse discrete cosine transform (IDCT) component that performs
4 integer IDCT calculations on transformed and quantized residual error values in a
5 video encoding operation.

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7 **49.** (original) The device as recited in claim 32, wherein the device
8 comprises a mobile device having a wireless interface.

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11 **50. – 96.** (canceled)